

## NOTES ON ERIOGONUM—II. VARIATION IN ERIOGONUM ATRORUBENS

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The subgenus **Pterogonum** (H. Gross) Reveal (comb. nov., based on *Pterogonum* H. Gross, Bot. Jahrb. 49: 239. 1913) forms a natural group of eight species which may be divided into two sections. Since *E. atrorubens* Engelm. in Wisliz. was described in 1848, the various authorities on the genus have placed it, and its related species, into two separate subgenera, distinguished by the presence or absence of winged achenes. The various treatments of *Eriogonum* until 1936 proposed that the known species with winged achenes, *E. atrorubens*, *E. alatum* Torr. and *E. hieracifolium* Benth. in DC., be placed in the subgenus *Eriogonum*, while the related, non-winged species, *E. ciliatum* Torr. ex Benth. in DC. and *E. greggii* Torr. & Gray, were placed in the subgenus *Ganysma* (S. Wats.) Greene. *Eriogonum nealleyi* Coult., while having winged achenes similar to those of *E. hieracifolium*, has been associated with species of the subgenus *Ganysma*. Unlike most of the Stokes monograph, *The Genus Eriogonum* (1936), the treatment of these species is excellent, and she points out their close affinities by placing them together in her Section 1A.

A recent review of type material at the University of California, Missouri Botanical Garden, U. S. National Herbarium, New York Botanical Garden, and the Gray Herbarium and Arnold Arboretum at Harvard University has allowed for a detailed examination of nearly all of the types in *Pterogonum*, and during this study, two undescribed varieties of *E. atrorubens* were discovered.

ERIOGONUM ATRORUBENS Engelm. in Wisliz., Mem. Tour North. Mex. 108. 1849.

Tall, erect, perennial herbs, 5-8 (-10) dm. high, glabrous and glaucous; leaves basal, the blades oblanceolate, lanceolate, or oblong to elliptic, (2.5-) 4-8 (-10) cm. long, (0.5-) 1-3 cm. wide, sparsely strigose on both surfaces, often more densely so below than above, or glabrous except for ciliated margins and midveins, or densely white-tomentose below and strigose above, petioles 3-8 (-12) cm. long, winged, expand-

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ing into broad petiole bases 3-7 mm. wide, glabrous to sparsely strigose or tomentose, especially along the margins and midveins; stems usually solitary, 1-4 dm. long, often inflated slightly below the first node, di- or trichotomously divided above, the branches erect and spreading with an involucre-bearing peduncle in the forks of each node; bracts scale-like or nearly so, 1-4 (-10) mm. long, linear-lanceolate, ternate, connate at the base, glabrous without, sparsely pilose to strigose within and along the margins and connate base; peduncles erect, straight or curving upward with a slight upward bend about three-quarters of their length from the base, (1-) 2-6 (-12) cm. long; involucre turbinate, 1.5-4 (-4.5) mm. long, 1-2.5 (-3) mm. wide, glabrous without, sparsely ciliated along the margins within, glabrous below, the 5 lobes rounded to truncate, or acute, dividing the tube mostly less than 1/3 its length, pedicels glabrous, reddish, 2-5 (-6) mm. long, curving downward outside the involucre after the perianth has fallen, bractlets linear-oblong to lanceolate, 2-3.5 mm. long, 20-40 flowered; perianth purple to red or maroon, often with a dark greenish midrib, 1.5-2.5 (-3) mm. long in anthesis, glabrous except for the minute scattered white tack-shaped, multicellular, glands that are sessile or short-stalked, the calyx-segments similar, broadly spatulate to obovate, connate only at the bases, acute to rounded at the apices; stamens 2-2.5 mm. long, filaments glabrous, anthers red to yellow, oblong, 0.6-0.8 (-1) mm. long, 0.3-0.6 (-0.7) mm. wide, pollen grains yellow to golden-yellow, oblong; perianth up to 6 mm. long in fruit and the segments closely appressed to the achene in some; achenes winged or nearly so, 4-5 mm. long, light greenish-brown to brown, ovate, the wide, winged bases tapering gradually upward to the short beaked, or beakless, apices.

Infrequent, but locally common, in Pinyon-Juniper woodlands, open meadows, and exposed areas in the low foothills and mountains of Nuevo Leon and adjacent Coahuila, westward to Zacatecas and Durango, and northward in the Sierra Madre Occidental through Chihuahua, Mexico to just south of the United States boundary opposite the extreme southwestern corner of New Mexico.

#### ERIOGONUM ATRORUBENS VAR. ATRORUBENS

*Pterogonum atrorubens* H. Gross, Bot. Jahrb. 49: 239. 1913.

Leaves strigose on both surfaces, often slightly more densely below than above.

TYPE: MEXICO: CHIHUAHUA: On the banks of streamlets at Cusi-huiriachic (spelled Cosihuiriachi in the original publication), collected in September, 1846 by A. Wislizenus 172 MO! Isotype GH. Fragments and drawings at NY.

Representative specimens:

MEXICO: COAHUILA: Santa Rita, 21 Aug 1948, Kenoyer & Crum 2994 (GH); s of Saltillo, 25 Jul-1 Aug 1880, Palmer 1175 (GH, NY, US); s of Saltillo, 10-13 Jul 1934, Pennell 17324 (PH, US); e of Fraile, 12

Jul 1941, *Stanford et al.* 359 (NY). CHIHUAHUA: Cajurichi, 13 Sep 1936, *Gentry* 2709 (GH, US); Pilanes, 18 Sep 1891, *Hartman* 780 (GH); Majalca, 25 Aug 1945, *Hewitt* 44 (GH); San Diego Canyon, Sierra Madre Mts., 16 Sep 1903, *M. E. Jones s.n.* (NY, POM, US); 12 mi w of San Antonio, 20 Sep 1939, *Muller* 3382 (GH); Sierra Madre, 21 Jun-29 Jul 1899, *E. W. Nelson* 6017 (GH, US); Rosario, e of La Junta, 14-15 Sep 1934, *Pennell* 18763 (PH, US); 10 km sw of Minaca, 16-17 Sep 1934, *Pennell* 18828 (PH, US); Sierra Madre, 2 Oct 1887, *Pringle* 1357 (GH, MO, NY, UC, US); Majalca, 11 Aug 1939, *White* 2367 (GH). NUEVO LEON: 15 mi sw of Galeana, 19 May 1934, *Mueller & Mueller* 466, 492, 18 Jul 1934, *Mueller & Mueller* 1045 (GH); Las Canaos on Cerro Potosi, 1 Jul 1935, *Mueller & Mueller* 2184 (CAS, GH, NY); Pablillo, se of Galeana, 26-30 Jun 1934, *Pennell* 17008 (PH, US); Cerro Potosi 7 Aug 1938, *Schneider* 973 (GH, NY, US); Pablillo, 5 Aug 1936, *Taylor* 85 (NY). ZACATECAS: 9 mi nw of Sombrerete, 26 Sep 1948, *Gentry* 8484 (GH, US).

The typical form, var. *atrorubens*, is widespread, but tends to be only locally common usually in the low foothills and mountains in the Pinon-Juniper woodlands of northern Mexico (Fig. 1). It is readily distinguished by the strigose hairs on both surfaces of the leaves, and like most buckwheats, the leaves are often more densely pubescent below than above. The species is closely related to *E. rupestre* S. Stokes which differs mainly in having pubescent flowers, and with this close relationship, I. M. Johnston (*Journ. Arn. Arb.* 25: 138, 1944) suggested that a more logical nomenclature would be to reduce this species to a variety of *E. atrorubens*. While this change was not made by Johnston, it is still a logical suggestion, but as *E. rupestre* does occupy a geographical area in eastern Chihuahua and does have a distinctive morphological feature, it seems best to wait until detailed field studies are carried out.

As one might suspect from the distribution of var. *atrorubens*, there are some morphological differences in the plants within each area. The Chihuahua plants tends to have stems with varying degrees of swelling or inflation, longer leaf-blades 4-10 cm. long, and a mature, fruiting perianth 3.5-5.0 mm. long that is clasping to the achene. The plants from Nuevo Leon and Coahuila, however, the stems are not inflated and the leaf-blades are shorter, being only 3-5 cm. long, and the mature flowers are only 3.0-3.5 mm. long and do not tend to clasp the achene. While these differences may be noted at present, the amount of material is still meager, and to base a new variety on the limited and variable material now available seems unwise. The Gentry collection from Zacatacus points as the key to this reasoning as it bridges the two populations not only in geographical distribution, but in its morphology. In this population the stems are not inflated, but the leaf-blades are 6-9 cm. long, and the mature flowers are 3-4 mm. long and do not tend to clasp the achene. The geographical separation between the various populations may be real, but until the intermediate mountain ranges which make a

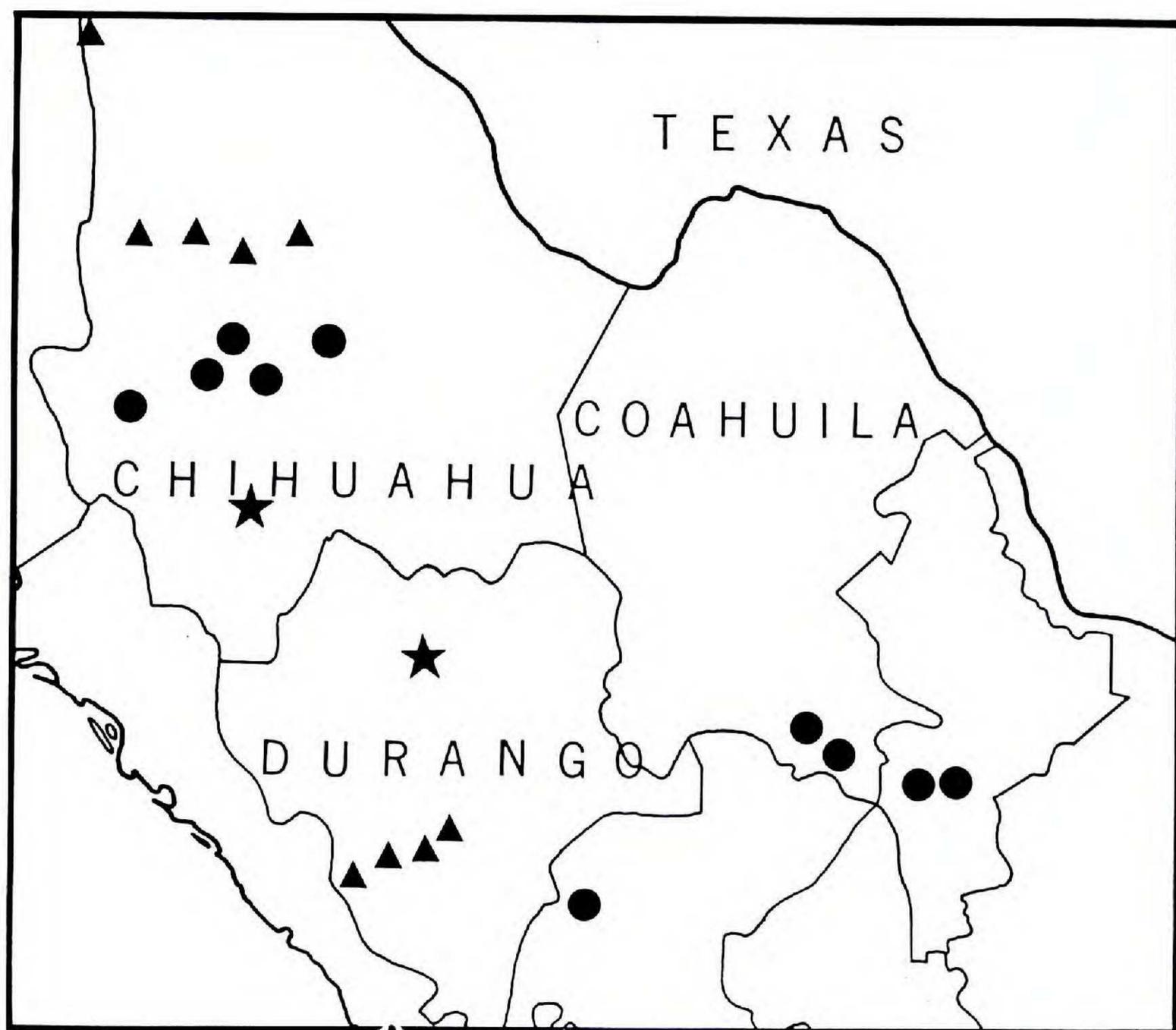


Fig. 1. Distribution of *Eriogonum atrorubens* var. *atrorubens* (circles), var. *pseudociliatum* (triangles), and var. *intonsum* (stars).

gentle arc from Nuevo Leon to Durango, and northward to Chihuahua are thoroughly botanized, one can not really be certain that it is.

**ERIOGONUM ATRORUBENS** var. **pseudociliatum** Reveal, var. nov.

A var. *atrorubente* differt foliis glabris vel sparsim pilosis supra margine dense ciliato excepto involucris lobis rotundis vel truncatis ad acutis, saepe reflexis.

TYPE: MEXICO: Durango: Otinapa, nw of C. Durango, 25 Jul-5 Aug 1906, *E. J. Palmer* 382 US! Isotypes GH, MO, NY.

Representative specimens:

MEXICO: Durango: 63 mi wsw of C. Durango, 28 Jun 1950, *Maysilles* 7184, 9-10 Aug 1952, *Maysilles* 7704 (NY, US); Llana Grande, 42 mi wsw of C. Durango, 10 Aug 1955, *Maysilles* 8463 (NY); El Salto, 12 Jul 1898, *E. W. Nelson* 4552 (GH, US); El Salto, 1 Sep 1936, *Pennell* 18554 (NY, PH, US); 34 mi w of C. Durango, 11 Aug 1956, *Waterfall* 12649 (GH, US). Chihuahua: Canyon near Santa Clara, 17 Aug 1936, *LeSueur* 77 (GH); San Luis Mts., 26 Jul 1892, *Mearns* 568 (US), 5 Sep 1893, *Mearns*

2123 (US), 26 Sep 1893, *Mearns* 2463 (GH, US); Madera, 27 May-3 Jun 1908, *Palmer* 280 (GH, NY, US); Llanura de Babicora, 19 Sep 1934, *Pennell* 19008 (NY, PH, US); Colonia Garcia, 23 Sep 1934, *Pennell* 19107, 19123 (PH, US); Santa Clara Mts., 22 Jul 1937, *Shreve* 7950 (US); Colonia Garcia, 11 Jun 1899, *Townsend & Barber* 72 (GH, NY, US).

The var. *pseudociliatum* is so named because it resembles *E. ciliatum* in that the leaf margins and midveins are often densely ciliate with short hairs. This new variety seems to occur at a slightly higher elevation than var. *atrorubens* and in more open sites such as dry meadows, open forests, and exposed mountain slopes.

As found in var. *atrorubens*, the disjunct populations in var. *pseudociliatum* differ in minor morphological features. In this case, those from Chihuahua (except *Palmer* 280) have involucre with acute lobes, whereas the Durango specimens tend to have involucre which are less rigid and the lobes vary from rounded to truncate with the divisions being less in these involucre than those found in the Chihuahua plants. As some overlapping may be seen in some involucre on the same plant specimens, it is enough to prevent any sharp separation, and since the intermediate areas are not well botanized, it seems best not to provide formal nomenclatural designations.

ERIOGONUM ATRORUBENS var. **intonsum** Reveal, var. nov.

A var. *atrorubente* et var. *pseudociliato* differt foliis subtus dense et copiose albo-tomentosis.

TYPE: MEXICO: DURANGO: Inde, Aug 1927, *B. P. Reko* 5239 US!

Representative specimens:

MEXICO: CHIHUAHUA: Without locality, 1894, *Lurnholtz* 1043 (GH, US); Norogachic, 13-25 Nov 1885, *Palmer* JJ (GH).

The var. *intonsum* (meaning unshaven or bearded) is presently known only from the above specimens. Its distinctive densely white-tomentose leaves quickly set it apart from the rest of *E. atrorubens*, and at first, seemed to represent a distinct species. Subsequent examination of other specimens in *E. atrorubens* soon revealed that the leaf character was the only real, differentiating feature to separate it from var *atrorubens* and var. *pseudociliatum*, and thus this population is assigned to a varietal rank.